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ABSTRACT

The set of three units, designed for middle and junior high school gifted students, includes 30 lessons on logic and critical thinking. Each lesson includes information on objectives, materials, and teaching presentation suggestions. Ten deductive reasoning lessons focus on such topics as fact and opinion, tests for validity of deductive arguments, and interpretation. The second unit, logic in advertising, presents 15 lessons, including such topics as facts as evidence, credibility, and literal and figurative words. The final unit, inductive reasoning, includes lessons on cause and effect and generalizations. Student worksheets are included for each unit. (CL)

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LOGIC

Study and Practice in Critical Thinking

A Study Unit Designed for

Education of the GIFTED in the Humanities and the Arts

by

PROJECT ALPHA

Advanced Learning Program in the Humanities and Arts

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This Unit has been prepared as part of Project ALPHA's efforts to design and develop innovative and challenging materials for Gifted Education. The Project Staff has endeavored to produce units that: (1) provide a strong interdisciplinary blend of the content and strategies of the Humanities and Arts; (2) foster both critical and creative thinking; (3) provide stimulating and enriching experiences for Gifted students; and (4) encourage the use of multiple teaching methods and styles.

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ALPHA UNIT

LOGIC

Study and Practice in Critical Thinking

OBJECTIVES:

1. To encourage students to develop an attitude of critical thinking.
2. To provide students with some terminology and methodology of logical reasoning.
3. To provide students with numerous examples and situations in which to employ the methods of logical reasoning and critical thinking.

NOTE TO THE TEACHER:

This unit is designed for presentation at the middle and junior high school levels. It may, however, be modified for presentation at lower and higher grade levels. It is composed of a number of lessons prepared by the ALPHA Staff and a variety of commercially produced materials which lend themselves to flexible adaptation on the part of the teacher. Sources of materials, techniques, examples, etc., will depend on the student audience, time to be spent on the unit, depth and breadth of study, etc. The teacher is free to tailor the design of the unit to meet the needs and objectives of specific student groups. As an aid to program design, the following are presented as samples of potential units. For details, see enclosed lesson sheets and worksheets.

LOGIC

Sample Units

Unit Title: Deductive Reasoning

Number of Lessons: 10

Approximate Class Time: 12 hours

Study Sheets and Worksheets: Introduction to Deductive and Inductive Reasoning, Facts As Evidence, Fact and Opinion, Tests for Validity of Deductive Arguments, Logic in Advertising (with accompanying Student Worksheets), Interpretation (with accompanying Student Worksheets).

Unit Title: Logic in Advertising

Number of Lessons: 15

Approximate Class Time: 12 hours

Study Sheets and Worksheets: Facts as Evidence, Fact and Opinion, Credibility, Logic in Advertising, Literal and Figurative Words, Logic in Advertising Student Worksheets.

Unit Title: Inductive Reasoning

Number of Lessons: 5

Approximate Class Time: 8-10 hours

Study Sheets and Worksheets: Introduction to Deductive and Inductive Reasoning, Cause and Effect, Generalizations, Recognizing and Analyzing Assumptions, Preliminary Worksheet A, Interpretation, Interpretation of a Written Account.

LOGIC

SUGGESTED MATERIALS:

Thinking Straight, Monroe C. Beardsley, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1975.

Understanding Arguments, Robert J. Fogelin, Harcourt Brace Jovanovich, Inc., N.Y., 1978.

Reasoning, Michael Scriven, McGraw-Hill Book Co., N.Y., 1976.

Games For The Super-Intellect, James F. Fixx, Popular Library, N.Y.,1972.

101 Puzzles In Thought And Logic, C.R. Wylie, Jr., Dover Publications Inc., New York, 1957.

Fallacy: The Counterfeit of Argument, W. Ward Fearnside and William B. Holther, Prentice-Hall, Inc., N.J., 1959.

How To Lie With Statistics, Darrell Huff, W.W. Norton and Co., Inc., N.Y., 1954.

What Are My Chances? Book A, Albert R. Shulte and Stuart A. Choate, Creative Publications, Palo Alto, Calif., 1977.

What Are My Chances, Book B, (same as Book A)

Test Your Logic, George J. Summers, Dover Publications, Inc., N.Y., 1972.

How To Take A Chance, Darrell Huff and Irving Geis, W.W. Norton and Co., Inc., N.Y. 1959.

Rhetoric In A Modern Mode, James K. Bell and Adrian A. Cohn, Glencoe Press, Beverly Hills, Calif., 1976.

Modern Rhetoric, Cleanth Brooks and Robert Penn Warren, Harcourt, Brace and World, N.Y., 1949.

The Practical Cogitator, Charles P. Curtis, Jr. and Ferris Greenslet, ed. Dell Publishing Co., Inc., N.Y., 1962.

Philosophical Inquiry, (2nd Ed.), Matthew Lipman et.al., Institute for the Advancement of Philosophy for Children, Upper Montclair, 1979

Making Judgments/Drawing Conclusions, The Center for Humanities, Inc., White Plains, N.Y. 1977 (A/V).

Clear Thinking, The Center for Humanities, Inc., White Plains, N.Y., 1976 (A/V).

Tac-Tickle, Harry O. Ruderman, WFF 'N Proof Learning Games Associates, Ann Arbor, Michigan.

TRI-NIM, Hicks and Hicks, WFF 'N Proof as above.

WFF, Laymen E. Allen, WFF 'N Proof as above.

WFF 'N Proof, Laymen E. Allen, WFF 'N Proof as above.

Qwik-Sane, J. R. O'Neil, WFF 'N Proof Learning Games Associates, Ann Arbor, Michigan.

Probaddility, Allen and Horne, WFF 'N Proof as above.

Strange Bedfellows, Steve Allen and Bob Allen, National Academic Games Project, Box 214, Newhall, Calif., 1970.

Rhetoric And Critical Thinking, Section III, Logic, Educulture Publishers, Inc., Costa Mesa, Calif., 1976. (12 parts, cassettes with student manuals).

Testing for Truth, Prepared by Sociological Resources for the Social Studies, Episodes in Social Inquiry series, Allyn and Bacon, Inc., Boston, 1969.

UNIT: LOGIC

LESSON: Introduction to Deductive and Inductive Reasoning

Objectives: To furnish the teacher with background information on deductive and inductive thought processes.

Materials: Rhetoric & Critical Thinking Kit- Deductive Reasoning Book (Module 13)

Guidelines for Teacher:

The following information is presented as reference material for the teacher preparing lessons in deductive and inductive reasoning.

Logical reasoning generally takes two forms:

- Deductive reasoning: a reasoning process which proceeds from a general statement or law, and leads to a specific and necessary conclusion.

- Inductive reasoning: a reasoning process that proceeds from limited, specific observations to inferred probable conclusions.

- A deductive argument proceeds from a general statement to a conclusion which is, or claims to be, valid. An argument is valid if its conclusion necessarily follows from its premises. For example:

All men are mortal.
John Smith is a man.
Therefore John Smith is mortal.

- Inductive reasoning attempts to move from specific premises to a general conclusion. There are three steps to the process. The first step is to make one or more limited observations. The second step is to infer what the implications of the observations may be. The third step is to draw a probable conclusion based on these inferences. Unlike deductive arguments, inductive arguments cannot be valid. Conclusions to inductive arguments are always probable. Degrees of probability will vary. For example:

All ravens that I've observed or heard about are black.
Evidence indicates that all ravens are black.
Therefore, all ravens are black (probably).

- Inductive and deductive reasoning complement each other. Inductive argument may lead to deductive reasoning and vice versa. The two processes overlap and students should be encouraged to use both.

UNIT: LOGIC

LESSON: Facts as Evidence

Objectives: Students will be able to see that facts are not absolutes by being able to distinguish between facts and fact claims.

Students will be able to recognize that even legitimate facts can be misinterpreted.

Materials: Rhetoric and Critical Thinking Kit- Module 11, Nature of Evidence (book and tape).

Alpha StudySheets & Worksheets: Fact and Opinion, Interpretation.

Presentation:

- Introduce by asking what kind of information a detective needs to solve a case, a doctor needs to diagnose illness, a lawyer needs to convict a suspect, etc.

- Discuss the term fact- what does it mean? Possible answers:

a) "something that can be proved"- Remind them that the earth was "proved" to be center of universe at one time.

b) "everybody agrees on it" - "The earth is flat"- "Man will never fly." "Thalidomide is a safe drug."

c) "Something that's true"- Ask for definition of true. Offer and examine the definition of fact as any piece of information that has objective reality.

- Discuss how some information that appears to be fact is actually a fact claim.

- Also discuss opinion- a judgment or statement of personal belief. Remind students that opinions may or may not be based on facts. Also, opinions do not need to be true, as facts must be by definition. An opinion, as such, is not knowledge.

- As an activity to study the nature of opinion, role play an accident or a robbery. (This activity is better if students are not well-briefed or especially aware of what they are about to see.) Ask students to provide a separate written account of what they witnessed. Then discuss the results in a group.

- Another discussion activity regarding opinion: Have students read " The Parable of the Blind Man and the Elephant" by John Godfrey Saxe. Then discuss the causes of the differences in opinion by the blind man.

- All facts may be classified into three categories.

- Historical facts- a true statement about an event in the past.

"The Declaration of Independence was signed in 1776."

- Definitional fact- a statement whose truth is based solely on the meaning and relationships of the words it contains.

"A zither is a stringed instrument."

- Experimental Fact- a statement whose truth has been determined by scientific, empirical, or experiential study.

"The chemical formula of water is H_2O."

- Ask students to list several facts and group them according to the above categories.

- Then, in order to re-inforce and summarize, provide students with a good selection of statements. Ask them to classify the statements as facts, opinions, fact claims, historical facts, etc. Students should explain why they classify a statement in any particular category.

- Possible statements:

1) The most democratic form of government was established in 1789 with the signing of the U.S. Constitution.

2) Beauty is that which when perceived pleases.

3) The earth is the only planet with life.
Etc.

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UNIT: LOGIC

LESSON: Fact and Opinion

Objectives: Students will be able to recognize that opinions may have considerable value as evidence.

Students will be able to determine what makes an opinion valuable using tests outlined below.

Materials: Rhetoric & Critical Thinking Kit- Nature of Evidence, Module II

ALPHA Student Worksheet: Fact and Opinion

Presentation:

- Discussion Questions: Which is more important: fact or opinion? Are some facts more important than other facts? Can this be said of opinions also? What determines importance of opinions?

- Credibility- refers to reliability or believability, the extent to which a person, document, etc. should be believed.

- Tests for Credibility:

1. Is there a high possibility of disagreement? If so, credibility is probably low. However, this is not an accurate test used by itself. For further explanation see Emily Dickinson's poem:

   Much madness, the divinest sense, to a discerning eye Much sense, the starkest madness/ Tis in this, as in all,/ That majority prevail/ Assent, and you are sane/ Demure and you're straight-away dangerous and handled with a chain.

2. Could there be a deliberate intent to deceive or persuade?

   -List and discuss types of individuals who deliberately attempt to persuade others. Which type of person would deliberately attempt to deceive?

   -Discuss the following example:

   The spokesman for a political party offers the opinion that his party's candidate is the person for the job because he's got the best policies for the people.

3. Is the opinion expressed a reasonable interpretation of the matter at hand?

-A reasonable interpretation is one based on logic, common sense, good judgment; it intelligently deals with all the known facts of the situation.

-Discuss examples such as the following:

a) Mike sees strange lights in the sky and decides that they must come from a U.F.O.

b) Sandra, who lives near New York City, feels great shock waves which also break some windows. She decides there must be an earthquake in the area.

c) You and your team are playing in the basketball championship. Your star player sprains his ankle. Your team loses the game, and you blame yourself for not wearing your lucky socks.

4. Is the source of the opinion biased?

-Discuss: What is bias? (lack of objectivity, open-mindedness, rationality)

-There are two types of bias.

a) Conflict of Interest- the inability of a person to render a fair and objective judgment because of a strong personal, professional, financial, etc. interest in the matter at hand.

-Discuss examples like the following:

The owner of a chemical plant claims that the wastes dumped by his company in a nearby stream are not harmful.

5. Prejudice- An attitude, positive or negative directed towards an individual, group, race, etc. because of their supposed characteristics.

-Discuss examples like the following:

A promotion is available and Sally thinks it should go to a woman because she like to see women in control.

Additional activity:

Ask students to complete Fact and Opinion Student Worksheet. Discuss their answers. Ask them to justify their classification.

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UNIT: LOGIC

LESSON: Fact and Opinion (Student Worksheet)

In the following chronology, you will note that some statements are of a factual type and others are opinions or interpretations drawn from facts. Distinguish between the two by marking those which you believe to be facts with an F and those which you believe to be opinions or interpretations with an O.

___ 1. 1776 John Hancock, Thomas Jefferson, Benjamin Franklin and other delegates from the thirteen American colonies sign the Declaration of Independence.

___ 2. 1776 By their victory at Trenton, the Americans prove to be better soldiers than the British.

___ 3. 1781 The Articles of Confederation create a tie between the colonies.

___ 4. 1787 Members of the Constitutional Convention reach agreement through compromise.

___ 5. 1793 Eli Whitney's cotton gin makes southern agriculture more productive and creates a boom in the slave market.

___ 6. 1798 Adams uses the Alien and Sedition Acts for the sole purpose of taking the vote away from his opponents.

___ 7. 1829 As the first popularly elected President, Jackson succeeds in making the government more democratic.

___ 8. 1852 Uncle Tom's Cabin brings violent reactions in the South and moves the South closer to secession.

___ 9. 1861 The Civil War in the United States begins with the Battle of Fort Sumter.

___ 10. 1862 The battle between the Monitor and the Virginia showed that the North had better ship builders.

___ 11. 500-1000 These are the Dark Ages in Europe.

___ 12. 1215 This is the date that the Magna Carta was signed. It is the basis of democracy.

___ 13. 1500 This was the beginning of the modern period of history.

___ 14. 15th and 16th Centuries. The Renaissance occurred during this time.

___ 15. 1789 This marks the beginning of freedom and nationalism in France.

Source: Raths, et al., Teaching for Thinking (Columbus: Charles E. Merrill Pub. Co., 1967), pp. 201-202.

UNIT: LOGIC

LESSON: Recognizing and Analyzing Assumptions (Teacher Guide)

Objectives: To demonstrate to students the importance of recognizing the nature, frequency, and importance of assumptions.

To provide students with opportunities to critically evaluate everyday assumptions.

Materials: ALPHA StudySheet: Recognizing and Analyzing Assumption

ALPHA Preliminary Worksheet A

Presentation:

- Without introduction, ask the students to complete Preliminary Worksheet A individually. Do not allow them to discuss the questions or to ask for further clarification. Instruct them to answer the questions as best they can.

- After the worksheet has been completed, discuss their answers. Ask them to list the assumptions they had to make to answer the questions. If their answers are too simplistic, point out which assumptions they probably made without knowing it. (Note: if students complain that they could not answer the questions because the given information was insufficient, this may be an indication that they are already thinking critically about assumptions.)

- Some specific points of discussion:
  In No. 5, remind the students that trains go slower when they start up, make a number of stops, etc. All these things affect the speed in any one hour.

  In No. 6, it is conceivable that the farmer reached into the basket and brought out the same three eggs each time; there may be more eggs left in the basket; etc.

  In No. 7, answers may vary from 5 to 25 miles depending on the placement of A,B and C.

  In No. 8, point out that the average weight, 100 lbs., is not the weight of <u>any</u> individual in the group. Thus, decisions based on averages should be carefully and initially made .

- Utilizing the StudySheet, discuss the definition of "assumption." Also discuss the frequency with which assumptions are made, the importance of recognizing which assumptions are involved in a decision, and possible impact or effect when one fails to recognize which assumptions are operative. It is probably best to discuss real-life situations that the students have experienced.

Each of the situations on the StudySheet should provide ample opportunity for discussion of the nature, frequency and possible impact of making assumptions.

- An interesting activity is one in which the students list and evaluate the importance of all the assumptions made during the average day, the school day, at home, etc.

- End the lesson with appropriate summarization. Allow for possible follow-up activities or interest on the part of the students.

UNIT: LOGIC

LESSON: Preliminary Worksheet A

Instructions: Answer the following questions. Do not ask for further direction. Do not give advice to others.

1. Three pencils cost 18¢. How much does each cost? _____
2. Write the smallest number using the digits 4 and 1 only. _____
3. How many numbers are there between 21 and 53? _____
4. Lines that do not intersect are _____.
5. A train travels 180 miles in three hours. How far does it go in one hour? _____
6. A farmer had a basket of eggs. He reached into the basket six times and each time brought out three eggs. How many eggs were in the basket? _____
7. If A is 10 miles from B, and B is 15 miles from C, how far is A from C? _____
8. Here are the weights of some Jr. High students. What is their average weight? 106 lbs., 92 lbs., 105 lbs., 118 lbs., 93 lbs., 86 lbs. average: _____
9. Right now the temperature outside is _____.

UNIT: LOGIC

LESSON: Recognizing and Analyzing Assumptions (Student Worksheet)

Assumptions are propositions which are taken for granted. Usually assumptions are made on the basis of experience, but sometimes they are made when encountering new situations. Making an assumption is neither right nor wrong. In fact, assumptions pervade our daily life to such an extent that to stop making them would be to stop being active. What is important, sometimes crucially important, is that we recognize when assumptions are being made, what assumptions are being made, and the degree of probability that our assumptions are based on reality.

Below are listed statements that contain assumptions. Some of them are trivial; some are much more important. Read each statement and decide (a) which assumptions are being made; (b) the extent to which the assumptions probably reflect reality; (c) what errors could be made or what negative consequences may result if the assumptions are not warranted.

1. Two automobiles are in a race. Car A reaches its destination ahead of Car B. Car A is the faster car.
2. Three pencils cost 30¢. Therefore, each pencil costs a dime.
3. If you read two very good stories by an author, you might look for a third story by the same author.
4. Some money is missing in class, and Roy is the likely suspect because he was caught stealing money before.
5. You get on the schoolbus designated to take you to school.
6. You are ill, and a friend recommends, on the basis of her experience, that you try the new doctor in town. You decide to visit that doctor.
7. You and a fellow student have responsibility for staging a party. Your responsibility is for the place and the refreshments. Your friend is in charge of arranging for a band. You haven't talked to your friend for two weeks and don't know what he has accomplished. You announce to your friends that all will be ready on time.
8. Your television set seems to have an electrical problem, but you don't have the money to have it repaired. Your friend, who does electrical work on automobiles, offers to fix it for free. You ask him to repair the set.

Discuss assumptions that you make everyday. Which are trivial; which are important?

UNIT: LOGIC

LESSON: Tests for Validity of Deductive Arguments

Objectives: The students will become familiar with the 4 rules to test the validity of a categorical syllogism.

Materials: Educulture Kit: Deductive Reasoning- Module 13

Presentation:

- The correctness of a deductive argument depends on 2 things: factual content or truth and structure or validity.

- Factual content can be tested through research or prior knowledge of a subject. If an argument about the eating habits of pelicans arises, you can rely upon previously gathered material or research the subject in the library.

- To test for accuracy of structure you must know the 4 specific rules for constructing a categorical syllogism.

- Rule 1 is that the major premise must be clear and precise. An unclear premise yields no valid conclusion. There is no valid argument that can follow from a major premise such as, "a few "A" students have blue eyes" or "Sometimes fat children grow up to be fat adults". On the other hand a clear and precise premise would be, "It always rains on the weekend." Although my information may not be true, the structure is correct.

- Rule 2 is that there must be 3 terms and only 3 terms in a categorical syllogism. These terms must be clear.

For example:

All fish have gills
1 = 2

Bass are fish
3 = 1

Bass have gills
3 = 2

is a valid argument according to Rule 2.

- The problem arises when your terms are either empty or ambiguous.

For example:

People who live in PA are Pennsylvanians

A = A

I live in PA

B = A

I am a Pennsylvanian

B = A

is an empty argument. The major premise is a restatement not an argument.

Rats have long tails

1 = 2

Herb (a man) is a rat

3 = 1

Herb has a long tail

3 = 2

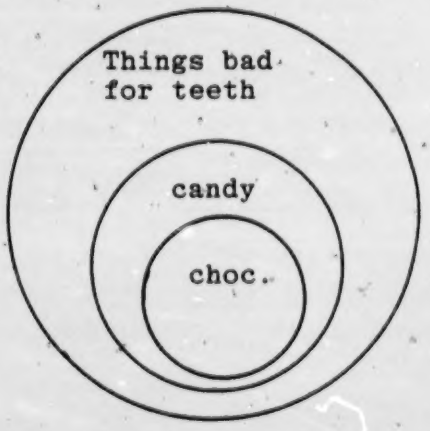
is an ambiguous argument. The rat in the first line does not have the same meaning as the rat in the second line. It is an ambiguous term.

- Rule 3 states that only one premise in an argument may be negative. However a negative premise demands a negative conclusion to be a valid argument. This rule can best be illustrated through diagrams.

The next 2 examples are valid arguments:

(1 Negative Premise) - Candy is not good for your teeth.
Chocolate is candy

(Negative Conclusion) - Chocolate is not good for your teeth



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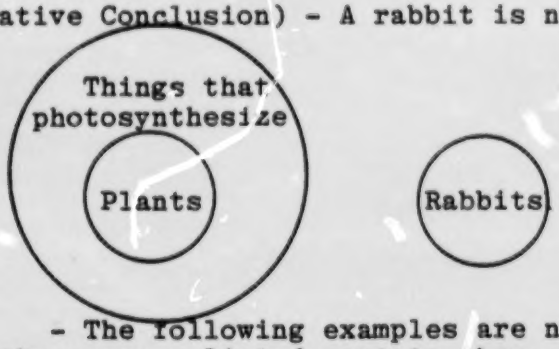
(Major Premise) - All plants photosynthesize.

(1 Negative Premise) - A rabbit does not photosynthesize.

(Negative Conclusion) - A rabbit is not a plant.



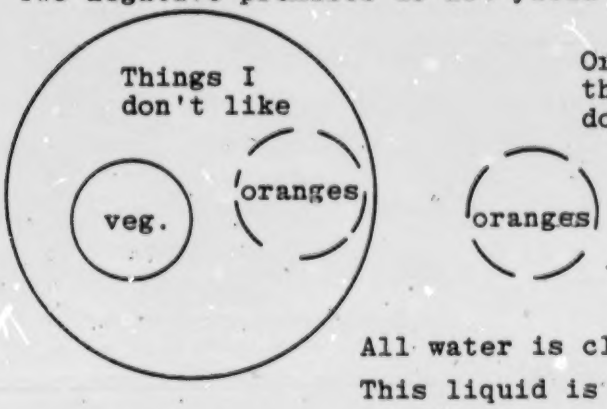
- The following examples are not valid arguments for the reasons listed next to them.

(Negative Premise) I do not like vegetables.

(Negative Premise) Oranges are not vegetables.

Therefore...

Two negative premises do not yield a valid conclusion.



Oranges could be in the set of "things I don't like" or not.

All water is clear.

This liquid is not clear.

Therefore, this liquid is grape juice.

- This argument isn't valid because the conclusion doesn't follow from the premises. That brings us to the final rule.

- Rule 4 states that all relationships in a categorical syllogism must be so definite and certain as to allow only one possible conclusion.

- Whenever Rule 4 is violated you will come up with 2 possible conclusions.

For example:

All polar bears are white

Snow is white

Therefore.....

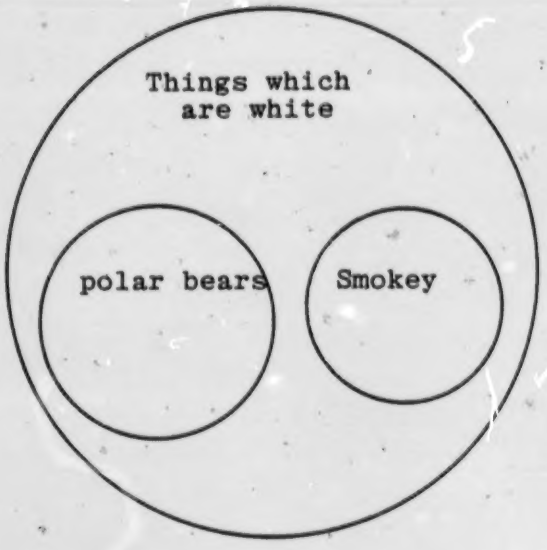
This rule applies to negative categorical syllogisms also.

For example:

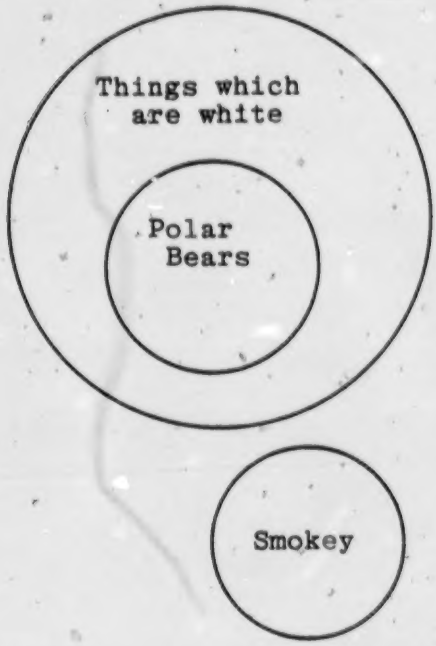
All polar bears are white

Smokey is not a polar bear.

Therefore.....



or



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NOTE: The diagrams used in the above examples are known as Venn Diagrams and can be a valuable tool in teaching logic. For further information, see Module 13, Deductive Reasoning of the Educulture Mini-Courses in Rhetoric and Critical Thinking or other books on Logic.

Recommendation To The Teacher:

It is advised that the students be given ample practice in working with syllogisms. It is however, important that they become familiar with the use of syllogisms and Venn Diagrams in checking the truths and validity of real arguments. Thus it is recommended that they study real arguments (political debates, statements from home and school, arguments with classmates, etc.) in order to gain beneficial practice in this area.

UNIT: LOGIC

LESSON: Interpretation

Objectives: To help students develop an understanding of the logical process of interpretation.

To provide students with practice in the deduction and induction of information from given data.

Materials: ALPHA StudySheet: Interpretation (Account)
ALPHA StudySheet: Interpretation (Map)

Presentation: - Introduce subject by examining the following definition:

- Interpretation is the process through which additional information is gathered from a set of given data (pieces of information).

- Explain to students that the process of interpreting may involve deduction, induction, or both types of reasoning. (For details, see ALPHA StudySheet: Introduction to Deductive and Inductive Reasoning.)

- Point out to students that we often make interpretations. We can, however, make serious mistakes in interpreting information if we are not careful.

- In order to help avoid mistakes in interpreting data, the following guidelines are offered:

- Decide which pieces of information are facts and which are opinions. (For further information, see ALPHA StudySheet: Facts and Opinions.)

- Interpretations should involve and/or be consistent with all major facts. (For further information, see ALPHA StudySheet: Facts as Evidence.)

- Opinions may be considered if they are judged to be good and appropriate. (For further information, see ALPHA StudySheets: Fact and Opinion, Credibility.)

- Remember to use only given data in making interpretation. If you assume that certain elements are present even though they are not specifically stated, you may be making a mistake. (For further information, see ALPHA StudySheet: Assumptions.) Exceptions to this guideline include those pieces of information that are recognized as generally applying, for example, scientific laws, medical facts, etc.

- In interpreting information, use sound logic; avoid emotional, biased, or hasty reasoning.

- After discussing the process and guidelines of interpretation, provide students with problems to be studied. ALPHA Student Worksheets may be used for this purpose, but the teacher is encouraged to provide other problems, especially real problems of the classroom, current events, etc. Regarding ALPHA Student Worksheets, the following guidelines as to grade level are provided:

  Interpretation of a Written Account-
  Grades 6-10
  Interpretation of a Map-
  Grades 4-6

UNIT: LOGIC

LESSON: Interpretation of a Written Account (Student Worksheet)

Read the following account, consider the statements below, and mark the statements according to the following classifications:

T- True
PT- Probably True
I- Insufficient Evidence to Determine
PF- Probably False
F- False

Use only the information provided and consider all data true as stated.

Chicago, April 1, 1921

Last night, at 10:35 PM, a shooting occurred on the Lower East Side.

Billy (The Fish) Fettucine and Hans (The Jerk) Klingmann were conducting a business meeting over dinner in the El Alamein Spaghetti Palace. Both men are considered by the F.B.I. as kingpins in organized crime in the Chicago area. At the time of the shooting, it was reported by Sam (Big Sam) Rossi, one of Fettucine's bodyguards, that a large black sedan moved down Main St. at a slow speed until it drew even with the Spaghetti Palace. At that time machine gun fire erupted from the sedan. The sedan then sped away.

Although the front window was shattered and damage was done inside the restaurant, no one was injured because a waiter, who had just served a meal of spaghetti and knockwurst, was holding a large metal tray by his side, thus deflecting all bullets.

Neither Fettucine nor Klingmann had comments. But the shaken Rossi is reported as saying, "Although I didn't get a good look at dem, I think dem hoods is from the Espinoza gang." Rossi was referring to the crime gang under the control of Juan (La Bum) Espinoza, a gang leader reputed to be struggling with Fettucine and Klingmann for control of Chicago crime. (F.B.I. Intelligence reports that the meeting in the restaurant was set up in order to effect a merger by Fettucine and Klingmann against Espinoza.)

In a related development, it was learned from a reliable source inside the mob, that Frank (The Abstract-Expressionist) Svenson, the head of all crime in the Midwest, has called an immediate meeting with Fettucine, Klingmann, and Espinoza. The source has indicated that Svenson is upset by recent divisions in his ranks and wishes to keep organized crime out of the public eye.

_____ 1. The shooting was an assassination attempt on Fettucine, Klingmann, or both.

_____ 2. The shooting was an ethnic protest against serving spaghetti with Knockwurst.

_____ 3. The shooting was conducted by the F.B.I. in order to eliminate crime figures.

_____ 4. Juan Espinoza ordered the shooting.

_____ 5. Frank Svenson ordered the shooting in order to stop the fighting among his underlings.

_____ 6. The El Alamein Spaghetti Palace is located on Main St.

_____ 7. Sam Rossi was outside in front of the restaurant at the time of the shooting.

_____ 8. The F.B.I. is glad to see in-fighting among organized crime leaders.

_____ 9. Fettucine and Klingmann are friends.

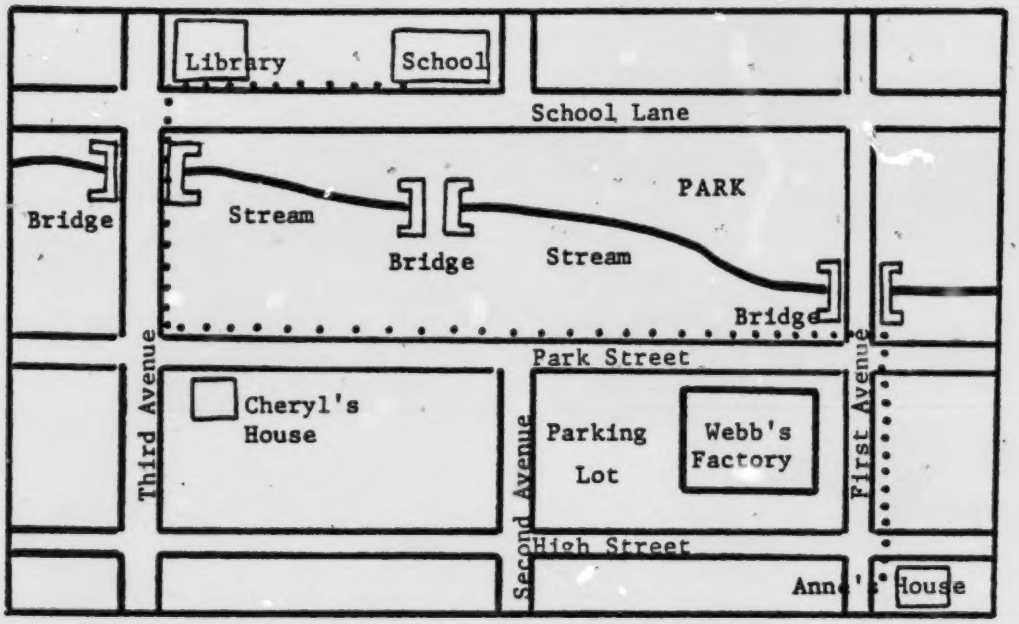
_____10. Fettucine, Klingmann and Espinoza will all go along with what Svenson wants.

UNIT: LOGIC

LESSON: Interpretation of a Map

Study the map below. Then mark the following statements as True (T), False (F) or Unknown because of insufficient information (?).

The map shows one route from Anne's house to school.



T F ? 1. Anne has to walk 5 blocks to school.

T F ? 2. Anne must walk over a bridge to get to school.

T F ? 3. Anne cannot walk through the park because it is fenced in.

T F ? 4. Anne has to cross School Lane.

T F ? 5. Anne has to cross Second Avenue.

T F ? 6. Anne passes the Library each day.

T F ? 7. If Anne could walk through Webb's Parking Lot and the park, it would cut her time in half.

T F ? 8. Anne probably takes this route when she meets Cheryl.

T F ? 9. Anne could cut through Webb's Parking Lot.

T F ? 10. Without going through the park, there are two shorter routes that Anne could take.

Reference: Raths, et al, Teaching for Thinking.

UNIT: LOGIC

LESSON: Credibility

Objectives: To familiarize students with the criteria for credibility.

To provide students with the opportunity to critically evaluate arguments and statements.

Materials: Rhetoric and Critical Thinking- Module 11
ALPHA Student Worksheet: Credibility of an Author

Presentation:

Before using the student sheet on credibility provide the students with the following guidelines which are used to judge an author's credibility.

- An author's statement need not be written. The testimony may be spoken as well.

- Credibility is based on expertise, objectivity and past record of accuracy.

-Expertise refers to the qualifications of the author on the subject to which he is speaking.

e.g. The dentist has expertise when he judges that you need dentures.

-Objectivity is the author's ability to speak without bias or prejudice.

e.g. The head of the Electric Company gives a talk on the dangers of gas heating.

-Past record of accuracy refers to the speaker's correctness or exactness in previous situations.

e.g. Madame Tasha has predicted the end of the world every year since 1974.

It is recommended that the students be given ample opportunity to judge the credibility of a variety of sources to include textbook, authors, journalists, public officials, writers of editorials, etc.

UNIT: LOGIC

LESSON: Credibility of an Author (Student Worksheet)

You are serving on a jury. The case concerns Al Smith who is accused of robbing Mertz' Grocery Store on the night of April 5, 1979. Your job is to determine the credibility of each witness on the basis of objectivity, expertise and past record of accuracy.

1st Witness: Mr. Mertz, owner of Mertz' Grocery Store.

We learn from Mr. Mertz' testimony that he has been robbed of $100 and one case of tastycakes. He failed to pick out Mr. Smith in a police line-up but during his testimony pointed across the room to Mr. Smith and shouted, "He's the man who robbed my store!"

2nd Witness: Officer Wheeler who is the policeman who apprehended Mr. Smith running down 5th Street away from Mertz' Grocery Store.

We learn from Officer Wheeler that the fingerprints on the case of tastycakes found behind Mertz' Grocery Store had been positively matched to Mr. Smith's.

3rd Witness: Hilda Hoffman who was walking her dog down 5th Street the night of April 5, 1979.

We learn that Hilda Hoffman has correctly identified Mr. Smith as the man who ran past her on the night of April 5, 1979.

What is the credibility of each witness? What are your reasons for assigning that credibility?

UNIT: LOGIC

LESSON: Literal and Figurative Words

Objectives: To help students develop an appreciation of the literal and figurative uses of words.

Materials: ALPHA StudySheet: Literal and Figurative Words

Presentation:

- Utilizing the StudySheet, ask students to fill in their answers without discussion or further directions.

- Having completed the StudySheet, students should be prepared to discuss and justify their answers.

- Conduct further discussion of real experiences which the students may have had in which confusion resulted over the mis-interpretation of the usage of words.

- Ask the students to list circumstances in which only the literal use of words would be appropriate (safe, necessary, etc.).

- Summarize lesson allowing for any appropriate follow-up by students.

UNIT: LOGIC

LESSON: Literal Words and Figurative Words (Student Worksheet)

Everyday we encounter, in both writing and conversation, literal and figurative interpretations of words. In distinguishing between them, we note that literal words or phrases utilize the precise, primary meaning of terms. Figurative words or phrases describe something through analogy to something else. Recognizing this distinction between literal and figurative terms is a valuable skill which will aid you in the communication process.

In the space below, write L if the statement should be taken literally, or F if the statement should be interpreted figuratively.

_____ 1. The small shed collapsed under the weight of tons of molten lava from the mountain.

_____ 2. Like a thief in the night, the teacher stole the hearts of her students.

_____ 3. The police whistle sounded like the shriek of a wild animal caught in a trap.

_____ 4. Justice remains the greatest power on earth.

_____ 5. The soldier looked heartbroken after he read the "Dear John" letter from his girlfriend.

_____ 6. His frozen expression stopped me in my tracks.

_____ 7. "The only way you will get in here is over my dead body."

_____ 8. "If you're not too busy, may I discuss the blueprints for the high rise with you next week?" he wrote.

_____ 9. His stare melted away my self-confidence.

_____ 10. The woman's face showed signs of youth and lines of age.

UNIT: LOGIC

LESSON: Logic in Advertising

Objectives: To familiarize the students with some approaches advertisers use to persuade.

To give the students a basis for analyzing various advertisements.

Materials: Critical Thinking- Book One

Presentation: - Discuss what the term propaganda brings to mind.

- Point out that in this Democratic country we are exposed to propaganda innumerable times each day. Ask the students how this can be.

- If they cannot come up with the example of advertising, discuss the definition of propaganda: Any rumor, idea or fact that is spread to convince or persuade someone.

- Discuss the idea that advertising is propaganda. Look up definitions of each to further the basis for discussion.

-"Advertisers don't sell products." Ask for contradictions or explanations.

- Advertisers often sell ideas. These ideas are connected to or fulfilled through the product or service. For example perfume advertisers sell sex appeal, some cigarette advertisers sell machismo or liberation, and advertisers of encyclopedia sets sell knowledge. The advertiser's hope is that the desire or feelings of the idea being sold will be transferred to the product being advertised. For example, some cigarette advertisers hope that women's desire for liberation and equality are transferred to cigarettes. And to be further liberated or as a sign of their liberation, women will buy their brand of cigarettes.

- For specific techniques and study examples used by advertisers to persuade or convince, see the following pages in Critical Thinking- Book One.

- Transfer Technique, p. 101
- Testimonial Technique, p. 103
- Glittering Generality, p. 108
- Name- Calling, p. 112
- Miscellaneous Techniques, p. 114

- Recommendation: Students may do a study of the techniques used in real advertisements. Students may analyze advertisements, discuss them or mount them with annotations about techniques, etc. Students may also conduct their own advertising campaigns using techniques studied. These ads can then be discussed by the class.

- For further practice, see ALPHA Student Worksheets on Logic in Advertising.

UNIT: LOGIC

LESSON: Logic in Advertising (Student Worksheet)

A fact, according to Webster's Dictionary, is a piece of information presented as having objective reality. It describes something which actually exists or occurs. On the other hand, an opinion represents a view, judgment, or appraisal formed in the mind about a particular matter. Advertisers often offer a combination of fact and opinion to the public for acceptance or rejection. While accepting opinions is neither right nor wrong, it is usually better to accept those based on fact. It is also appropriate to make a judgment about the source of the opinion. Is the source reliable? Is the source a recognized authority in this field? Does the source represent special interests? Etc.

Below are some statements about the accompanying advertisements. As a possible consumer of such items, you might believe that some or all of the statements are true. If you think a statement is a fact, or can reasonably be believed, place an F in front of it. If you think the statement is an opinion, or is in some way questionable, place an O in front of it. Be prepared to explain your choices.

CB Ad

_____ 1. "RCA" is a name you know and trust.

_____ 2. RCA's reputation stands for dependable communications.

_____ 3. Having a CB is fun and exciting.

_____ 4. You can do important things with a CB, like find out about traffic and weather.

_____ 5. Just talking to other CBers can be fun.

_____ 6. The Co-Pilot includes the latest advances in reception and transmission.

_____ 7. Phase Lock Loop and Delta Tuning are probably very important modifications.

_____ 8. There are many other qualities the dealer can explain to you.

_____ 9. RCA is good at building televisions and radios, so they probably make a very good CB.

_____10. The Co-Pilot sits on top of (i.e., is better than) a lot of other CB brands.

CB by RCA
Now you're talking!

Sitting on top of a lot of CB brands you've probably never heard of, is a name you know and trust.

CB by RCA!

Dependable communications is what RCA is all about.

And now RCA is making it possible for you to get in on all the CB fun and excitement with equipment you know will keep you in touch. Like finding out traffic and weather conditions ahead. Radioing for help for yourself or others. Or just joining in on all the "CB Chatter."

The new RCA CB Co-Pilot line includes models with the latest engineering advances for the clearest possible reception and transmission. Features like Phase Lock Loop and Delta Tuning keep your transmitting and receiving frequencies as clear as can be and right on the button. Plus a host of other quality features your RCA Dealer will be happy to explain to you.

You've waited long enough! Walk into your RCA Dealer's today. And walk out with a CB Radio you *know* you can trust: RCA CB Co-Pilot.

Now you're talking!

RCA CB Co-Pilot

UNIT: LOGIC

LESSON: Logic in Advertising (Student Worksheet)

Tennis Racket Advertisement

Below are some statements about the accompanying advertisement. As a potential consumer of this item, you might believe that some or all of the statements are true. If you think a statement is a fact, or can reasonably be believed, place an F in front of it. If you think a statement is an opinion, or rather questionable, place an O in front of it. Be prepared to explain your choices.

_____ 1. Obviously, the larger the racket, the easier to hit a ball.

_____ 2. The Prince weighs about the same and moves through the air about the same as an ordinary racket.

_____ 3. The racket shown as "ordinary" really is an ordinary racket.

_____ 4. Despite the Prince's greater size, it is no harder to handle than an ordinary racket.

_____ 5. The fact that some big name players use the racket shows that it's a really good racket.

_____ 6. Because of its shape, the Prince allows a poor player to play well.

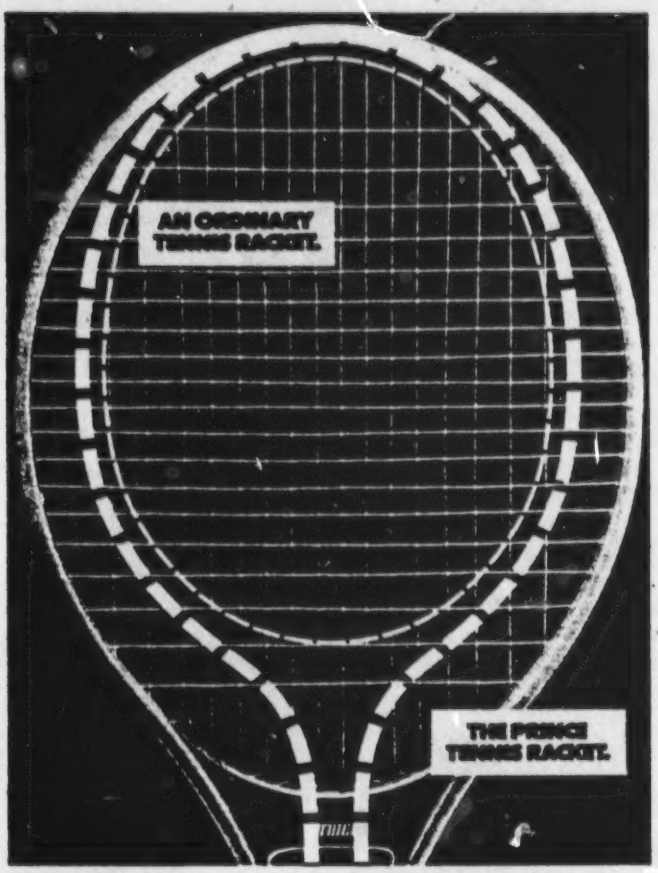
_____ 7. The Prince's price is no higher than some ordinary rackets.

_____ 8. Despite its size, the Prince breaks no tennis rules.

_____ 9. The Prince has already started a revolution in tennis.

_____10. If you don't buy a Prince, your opponent, who will probably buy one, will have an advantage over you.

THE PRINCE RACKET.
WITHOUT BREAKING ANY RULES, WE BROKE ALL THE RULES.



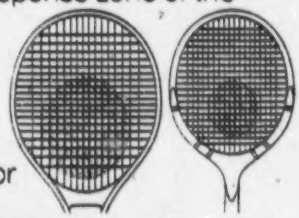
With the help of Howard Head, Prince created a tennis racket with a 50% larger hitting area. This new racket weighs no more and offers no more wind resistance than an ordinary racket. What's more, it's entirely acceptable under the official rules of tennis. This ingenious new racket is called the Prince. And already it's created a revolution in tennis.

BIG NAMES USE THE BIG RACKET.

Respected players are paying the Prince the highest of compliments—they're using it. Our growing list includes Ion Tiriac, Valerie Ziegenfuss, Don Budge (and his entire teaching staff), Clark Graebner and Frank Froehling.

A LARGER SWEET SPOT.

A sweet spot, as if you didn't know, is the high response zone of the strings. A sweet spot 4 times as large as that of an ordinary racket has an obvious and enormous benefit for any player—from a rank beginner to a Wimbledon champion.



MORE ACCURACY. LESS EFFORT.

The width of the Prince racket places more of the head's mass further from the center of the racket. This makes the racket twist less in a player's hand. Which in turn leads to truer, more controlled shots with less effort.

IT'S EASIER TO HIT THE BALL HARDER.

In addition to being wider for less twist, the head extends deeper into the power region. This combination, wider and deeper, is what makes the larger sweet spot on the Prince. Which gives you more power with the same swing.

THE IDEAL RACKET HAS AN IDEAL PRICE.

The Prince frame sells for $65: a price no higher than that of some ordinary rackets. And now that we've told you a little about the Prince you probably want to see our amazing new tennis racket for yourself.

Toll free, call (900) 257-9480 or, in New Jersey, (800) 792-8697, for the pro shop or tennis shop nearest you. Before your opponent does.

Pat. Nos. 3,702,701; 3,805,366; 3,809,172. Other U.S. and Foreign Patents Pending.
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UNIT: LOGIC

LESSON: Logic in Advertising (Student Worksheet)

Mississippi Advertisement

Below are some statements about the accompanying advertisement. As someone who may be interested in relocating, you might believe that some or all of these statements are true. If you think a statement is a fact, or can reasonably be believed, place an F in front of it. If you think a statement is an opinion, or rather questionable, place an O in front of it. Be prepared to explain your choices.

_____ 1. The purpose of this ad is to ruin Mississippi's image.
_____ 2. You have a bad image of Mississippi.
_____ 3. Everyone in business knows the problem of having a product that's somehow picked up a not-so-great image.
_____ 4. Most people in Mississippi are willing and eager to work.
_____ 5. Mississippi has an ideal climate.
_____ 6. Everyone in Mississippi is friendly.
_____ 7. Except snow skiing, anything you would like to do outdoors can be done in Mississippi.
_____ 8. Governor Bill Waller is a good authority when he says that Mississippi is superb for a vacation.
_____ 9. Sending the free statistical book about Mississippi to you would make Governor Waller happy.
_____10. Mississippi has some of the best tax laws anywhere.
_____11. The statistical book contains more truth about Mississippi.
_____12. An abundance of raw materials is important to businesses.
_____13. Mississippi has easily accessible land, sea, and air transportation.

We're out to ruin our image.

Anybody in business knows the problem: You've got a great product that's somehow picked up a not-so-great image.

That's how I feel about Mississippi. Simply stated, it's superb for a vacation, a great place to live and an even better place to work.

Mississippi has a willing and eager labor force, an abundance of raw materials, easily-accessible land, sea and air transportation and some of the best tax laws anywhere.

The climate? It's ideal. The people are friendly. And there's everything you'd care to do in the great outdoors except snow ski.

Bill Waller
William L. Waller
Governor

But that's only part of the truth. The rest is in our free statistical book, which we'd be happy to send you.

We hope it will give you cause to think again about moving your plant to Mississippi. If not, we at least hope it changes your image of us.

Along with my Re-Think Mississippi button please send me information on:

- ◯ Statistical Book on industrial opportunities in Mississippi. (Attach coupon to your business letterhead.)
- ◯ Travel information (our new travel guide) See Mississippi while looking for a new plant site.

Name_____ Title_____

Business _____

Address _____

City_____ State____ ZIP_____

Mississippi A & I Board/Industrial Dept.
P. O. Box 849/Jackson, Mississippi 39205
US

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UNIT: LOGIC

LESSON: Inductive Reasoning: Generalizations

Objectives: To familiarize the students with the components of inductive reasoning.

To introduce the students to generalizations- one type of inductive conclusion- and the tests for their validity.

Materials: Educulture Kit- Inductive Reasoning- Module 12

Presentation:

- Inductive reasoning involves 3 steps: observation, inference and conclusion.

- Observation is gathering information through our senses: things we see, smell, hear, etc.

- Inference entails forming a general idea from our observation about things that are unobserved.

- A conclusion is just a statement of the inference that is made from the observation.

- For example, I observe on 3 different occasions that kittens are born with their eyes closed. I infer that probably all kittens are born with their eyes closed. I conclude, "All kittens are born with their eyes closed."

- A generalization is an inductive conclusion which by definition makes a statement about something that has not been directly observed.

- There are 3 types of generalizations: universal, qualified, and statistical.

- A universal generalization states something about the entire population in question. For example: "All students in this school are under 20" or "No students in this school are over 20."

- A qualified generalization makes a statement about a segment of the population which is defined descriptively. For example: "Most citrus fruits contain Vitamin C," or "Many Californians are vegetarians."

- A statistical generalization makes a statement about a segment of the population that is defined numerically. For example: "Twenty percent of the student body wear glasses." or "Nine out of ten students are middle class."

- Hasty generalizations, generalizations which have been incorrectly formed, occur for 3 different reasons: numerically insignificant sample, nonrepresentative sample, and/or incorrect analysis of sample. An incorrect conclusion for any of these reasons would naturally make the argument invalid.

- A numerically insignificant sample means that you have not observed enough cases to make a generalization. For example: After observing one accident at a particular corner, you conclude that that intersection is dangerous. Or, after discovering a worm in an apple, you conclude that all apples are inhabited by worms. A numerically insignificant sample means your observation was limited in number whereas.....

- A nonrepresentative sample means that your observation was limited in type or variety. For example: After polling the owners of Rolls Royces you conclude the average American eats filet mignon every week. Or, after reading of a DC-10 plane crash, you conclude all planes are flying coffins.

- Even if you've made a numerically significant sample of a representative population you could still void the argument by making an incorrect analysis of the sample. In other words you draw a wrong or irrelevant conclusion. For example: After flunking a test for which you did not study you conclude the teacher is an unfair grader. Or, most hockey players have some false teeth. This is because they didn't take care of their teeth when they were younger.

Recommendation To The Teacher:

It is advised that the students be given ample practice in working with generalizations. Obviously, a very critical approach on the part of the teacher and students is required. Errors in generalization have led to prejudice, segregation, etc. Students, therefore, should develop and test their generalizations very carefully. It should also be remembered that generalizations are a type of inductive argument and, therefore, are only probably true; and of course, there are different degrees of probability. For further information, see ALPHA StudySheet: Introduction to Deductive/Inductive Reasoning.

UNIT: LOGIC

LESSON: Inductive Reasoning: Cause & Effect

Objectives: To familiarize the students with 3 methods for analyzing cause and effect reasoning.

Materials: Rhetoric and Critical Thinking Kit- Inductive Reasoning- Module 12

Presentation:

- Inductive reasoning proceeds from a limited observation to a probable conclusion. Likewise, cause and effect analysis (a type of inductive reasoning) proceeds from an observable effect to an inferred cause.

- There are 3 methods used to infer a probable cause for an observed effect. They are method of agreement, method of difference, and method of residues.

- Method of agreement is determining the possible cause by finding the common factor of each observed effect and calling that factor the cause. For example: 12 different murders in the Memphis area can be linked to the infamous Memphis Marauder because of the pattern in the killings. All the victims are about 5' 3", blonde-haired high school aged females. They met their demise in various manners in all sections of the city but the binding factor is a long-stemmed red rose left on each body. We use the method of agreement in this instance to determine a possible reason for suspecting the Memphis Marauder by finding the factors that are common to all murders (i.e. age and appearance of victims and long-stemmed red rose.)

- Method of difference is determining a probable cause by listing all possible factors and eliminating those factors that occur where the effect is not observed. The factor that is left is named the cause. For example: Jean and Jane each made a loaf of bread. Jean's loaf was light and airy and golden brown. Jane's on the other hand, was golden brown but flat and very heavy. Below are copies of the recipes they used.

Jean's	Joan's
1 packet yeast	½ cup warm water
½ cup warm water	1 Tbsp. sugar
1 Tbsp sugar	½ tsp. salt
½ tsp. salt	1 cup milk
1 cup milk	1 Tbsp. shortening
1 Tbsp. shortening	4-5 cups flour
4-5 cups flour	

What's the difference between the recipes? What could have caused the difference between the girls' loaves of bread?

- The above 2 methods can be used in conjunction to determine a possible cause. For example, 3 African violets sit on the same window sill. Two are bushy and full of blooms and the other is scrawny and rather limp. They were all started from a larger healthy-looking plant. They get fed once a month. The 2 bushy looking ones get watered once a week; the scrawny one gets watered everyday. In this instance we use the method of agreement to determine those factors the 2 healthy plants have in common, but since there is a discrepancy in appearance between the plants we use the method of differences to determine the possible cause for the discrepancy.

- The last cause and effect analysis is method of residues. The method makes a list of all possible causes and by observation and experimentation eliminates all but the most probable. For example, Tom's car hasn't been running very well lately. Possible causes:

no gas
improperly inflated tires
needs a tune-up
needs oil change

Tom has just filled the tank with gas, and had the air pressure checked in his tires. His brother is a mechanic and tuned the car for Tom a month ago. After we eliminate most of the causes the one that remains is that the car needs an oil change.

It is further recommended that the teacher consider having the students conduct long or short-term experiments, discussions, investigations, etc. through which they will have practice in discovering cause and effect relationships in real and/or hypothetical situations.